IN THE CLAIMS:

Claim 1 (original). A method of manufacturing a surface mount SAW device, the surface mount SAW device comprising: a mounting substrate that includes an insulating substrate, an external electrode for surface mount arranged on a bottom of the insulating substrate, and a wiring pattern arranged above the insulating substrate and said external electrode; a SAW chip that includes a piezoelectric substrate, an IDT electrode formed on one surface of the piezoelectric substrate, and a connection pad connected to said wiring pattern through a conductor bump; and a sealing resin that is formed to cover the SAW chip from an outer surface of the SAW chip to an upper surface of the mounting substrate while mounting said SAW chip on the mounting substrate in a face-down state by flip-chip bonding, and that thereby forms an airtight space between said IDT electrode and said mount substrate, the method comprising:

a flip-chip mounting step of connecting said wiring pattern to said connection pad through said conductor bump, thereby mounting the SAW chip on said mounting substrate by the flip-chip bonding;

a lamination step of mounting a resin sheet, larger in an area than an upper surface of said SAW chip, on the upper surface of the SAW chip, and pressurizing the resin sheet while softening or melting the resin sheet from one end of the mounting substrate to the other end of the mounting substrate, thereby covering the outer surface of the SAW chip with a resin while securing said airtight space;

a press molding step of pressurizing and heating the SAW chip having the outer surface laminated with said resin, thereby hardening the resin while suppressing expansion of a gas within said airtight space; and

a post-hardening step of heating the SAW device which has been subjected to the press molding step at a temperature and at a time at which the resin is completely hardened, wherein

a thickness tr of the resin sheet before said lamination step satisfies:

$L/[(X+Gx)(Y+Gy)] \leq tr$, where

$L=(X+Gx)(Y+Gy)(H+T+A)-XYT-XYA-[XVyA+YVxA+(4VxVyA)/3]$,

(L: a volume of the resin sheet necessary to seal the outer surface of one SAW chip, X: a length of one side of the SAW chip, Y: a length of the other side of the SAW chip, Gx: a

distance between SAW chips adjacent in X direction, Vx: a distance from a dicing cutting margin extending in Y direction to a side surface of the proximate SAW chip, Gy: a distance between the SAW chips adjacent in Y direction, Vy: a distance from a dicing cutting margin extending in X direction to a side surface of the proximate SAW chip, H: a thickness of the resin located on the upper surface of one SAW chip after the outer surface of one SAW chip is completed in being covered with the resin sheet, T: a thickness of the piezoelectric substrate, and A: a distance from an upper surface of a mounting substrate base material to a bottom of the piezoelectric substrate).

Claim 2 (original). The surface mount SAW device manufacturing method according to claim 1, wherein

said lamination step includes a heat roller lamination step of pressurizing the mounting substrate and the SAW chip between a pressing roller rotating while being press-contacted with an upper surface of said resin sheet and heated to a predetermined temperature, and a guide member provided on a lower surface of said mounting substrate, and

the heat roller lamination step satisfies the following conditions:

(a) a heating temperature of the pressing roller is set to be equal to or higher than a softening or melting temperature of the resin sheet and lower than a hardening temperature of the resin sheet;

(b) the resin sheet is softened or molten by heating and pressurizing the upper surface of said resin sheet using said pressing roller; and

(c) the resin sheet thus softened or molten is heated and pressurized using the pressing roller, thereby covering the SAW chip with the resin while securing said airtight space.

Claim 3 (original). The surface mount SAW device manufacturing method according to claim 1, wherein

said lamination step includes a blade lamination step of pressurizing the mounting substrate and the SAW chip between a blade moving in one direction while being press-contacted at its tip with an upper surface of said resin sheet, and heated to a

predetermined temperature, and a guide member provided on a lower surface of said mounting substrate, and

the blade lamination step satisfies the following conditions:

(a) a heating temperature of said blade is set to be equal to or higher than a softening or melting temperature of the resin sheet and lower than a hardening temperature of the resin sheet;

(b) said resin sheet is softened or molten by heating and pressurizing the upper surface of said resin sheet using said blade; and

(c) the resin sheet thus softened or molten is heated and pressurized using the blade, thereby covering the SAW chip with the resin while securing the airtight space.

Claim 4 (currently amended): The surface mount SAW device manufacturing method according to ~~one of~~ claim 1, 2, or 3, wherein

said resin sheet is constituted so that a separable protection film is bonded onto an upper surface of a resin sheet main body that has viscosity, and

after said lamination step and said press molding step are sequentially executed while a lower surface of the resin sheet main body is provided on the upper surface of said SAW chip, said protection film is separated.

Claim 5 (currently amended): The surface mount SAW device manufacturing method according to ~~any one of claims 1 to 4~~ claim 1, wherein

said protection film consists of polyethylene terephthalate (PET).

Claim 6 (currently amended): The surface mount SAW device manufacturing method according to ~~any one of claims 1 to 5~~ claim 1, wherein

said lamination step is executed in a reduced-pressure atmosphere.

Claim 7 (currently amended): The surface mount SAW device manufacturing method according to ~~any one of claims 1 to 5~~ claim 1, wherein

said lamination step is executed in an inert gas atmosphere.

Claim 8 (currently amended): The surface mount SAW device manufacturing method according to ~~any one of claims 1 to 7~~ claim 1, wherein

said mounting substrate is a mounting substrate base material having a plurality of mounting substrate pieces connected to one another to form a sheet, and

at said lamination step, the resin sheet having a large area is laminated on a plurality of SAW chips mounted on the mounting substrate base material after the large-area resin sheet is provided to spread over upper surfaces of the plurality of SAW chips.

Claim 9 (original). The surface mount SAW device manufacturing method according to claim 8, wherein

at said press molding step executed using pressurizing plates provided on upper and lower side surfaces sides, respectively after the large-area resin sheet is laminated on the plurality of SAW chips mounted on said mounting substrate base material, spacers are used to limit a pressing force of said pressurizing plates so as to prevent an excessive pressure from being applied to the SAW chip pieces laminated with the resin.

Claim 10 (currently amended): The surface mount SAW device manufacturing method according to ~~claim 8 or 9~~ claim 8, wherein

at said press molding step, a frame is arranged on the resin sheet provided on the plurality of SAW chips mounted on said mounting substrate base material, the overall mounting substrate base material is press-molded together with the frame, and the mounting substrate base material is press-molded while the resin located below the frame is pressed.

Claim 11 (original). The surface mount SAW device manufacturing method according to claim 10, wherein

said frame is integrated with a pressurizing member that press-molds the frame.

Claim 12 (currently amended): The surface mount SAW device manufacturing method according to ~~claim 8 or 9~~ claim 8, wherein

at said press molding step, said frame is arranged on said mounting substrate base material so as to surround the plurality of SAW chips at a position away at an outside diameter side, the resin sheet provided on upper surfaces of the plurality of SAW chips is press-molded, and expansion of the mounting substrate base material toward a side surface of the resin sheet is suppressed by an inner peripheral surface of the frame.

Claim 13 (new): The surface mount SAW device manufacturing method according to claim 4, wherein

said protection film consists of polyethylene terephthalate (PET).

Claim 14 (new): The surface mount SAW device manufacturing method according to claim 4, wherein

said lamination step is executed in a reduced-pressure atmosphere.

Claim 15 (new): The surface mount SAW device manufacturing method according to claim 5, wherein

said lamination step is executed in a reduced-pressure atmosphere.

Claim 16 (new): The surface mount SAW device manufacturing method according to claim 4, wherein

said lamination step is executed in an inert gas atmosphere.

Claim 17 (new): The surface mount SAW device manufacturing method according to claim 5, wherein

said lamination step is executed in an inert gas atmosphere.

Claim 18 (new): The surface mount SAW device manufacturing method according to claim 4, wherein

said mounting substrate is a mounting substrate base material having a plurality of mounting substrate pieces connected to one another to form a sheet, and

at said lamination step, the resin sheet having a large area is laminated on a plurality of SAW chips mounted on the mounting substrate base material after the large-area resin sheet is provided to spread over upper surfaces of the plurality of SAW chips.

Claim 19 (new): The surface mount SAW device manufacturing method according to claim 5, wherein

said mounting substrate is a mounting substrate base material having a plurality of mounting substrate pieces connected to one another to form a sheet, and

at said lamination step, the resin sheet having a large area is laminated on a plurality of SAW chips mounted on the mounting substrate base material after the large-area resin sheet is provided to spread over upper surfaces of the plurality of SAW chips.

Claim 20 (new): The surface mount SAW device manufacturing method according to claim 6, wherein

said mounting substrate is a mounting substrate base material having a plurality of mounting substrate pieces connected to one another to form a sheet, and

at said lamination step, the resin sheet having a large area is laminated on a plurality of SAW chips mounted on the mounting substrate base material after the large-area resin sheet is provided to spread over upper surfaces of the plurality of SAW chips.

Claim 21 (new): The surface mount SAW device manufacturing method according to claim 7, wherein

said mounting substrate is a mounting substrate base material having a plurality of mounting substrate pieces connected to one another to form a sheet, and

at said lamination step, the resin sheet having a large area is laminated on a plurality of SAW chips mounted on the mounting substrate base material after the large-area resin sheet is provided to spread over upper surfaces of the plurality of SAW chips.

Claim 22 (new): The surface mount SAW device manufacturing method according to claim 9, wherein

at said press molding step, a frame is arranged on the resin sheet provided on the plurality of SAW chips mounted on said mounting substrate base material, the overall mounting substrate base material is press-molded together with the frame, and the mounting substrate base material is press-molded while the resin located below the frame is pressed.

Claim 23 (new): The surface mount SAW device manufacturing method according to claim 9, wherein

at said press molding step, said frame is arranged on said mounting substrate base material so as to surround the plurality of SAW chips at a position away at an outside diameter side, the resin sheet provided on upper surfaces of the plurality of SAW chips is press-molded, and expansion of the mounting substrate base material toward a side surface of the resin sheet is suppressed by an inner peripheral surface of the frame.